

## CLAIMS

The claims are as listed below with ~~strikethrough~~ and double brackets ([[ ]]) indicating the deletion of text from the claims and underline indicating the insertion of text into the claims.

1. (Currently Amended) A particle accelerator comprising:
  - an injector for generating charged particles;
  - an electromagnetic drive subsystem for generating pulses of electromagnetic waves;
  - a first accelerating section adapted to receive said electromagnetic waves and to transfer energy from said electromagnetic waves to said charged particles as said charged particles travel therethrough;
  - a second accelerating section adapted to transfer energy to said charged particles as said charged particles travel therethrough;
  - a waveguide connected to said electromagnetic drive subsystem and adapted to deliver said electromagnetic waves from said electromagnetic drive subsystem to said first accelerating section, said waveguide being having a wall at least partially physically interposed between said first accelerating section and said second accelerating section; and,
  - a 3 dB waveguide hybrid junction formed at least partially from said wall, said 3 dB waveguide hybrid junction defining a coupling window in said wall; and
  - a tube connected to and extending between said first accelerating section and said second accelerating section, said tube being adapted to enable said charged particles to travel between said first accelerating section and said second accelerating section.
  
2. (Currently Amended) The particle accelerator of Claim 1, wherein A particle accelerator comprising:  
an injector for generating charged particles;

an electromagnetic drive subsystem for generating pulses of electromagnetic waves;  
a first accelerating section adapted to receive said electromagnetic waves and to transfer  
energy from said electromagnetic waves to said charged particles as said charged particles travel  
therethrough;

a second accelerating section adapted to transfer energy to said charged particles as said  
charged particles travel therethrough;

a waveguide connected to said electromagnetic drive subsystem and adapted to deliver  
said electromagnetic waves from said electromagnetic drive subsystem to said first accelerating  
section, said waveguide has having a wall and being at least partially physically interposed  
between said first accelerating section and said second accelerating section; and,

a tube connected to and extending between said first accelerating section and said second  
accelerating section, said tube is being formed within said wall and being adapted to enable said  
charged particles to travel between said first accelerating section and said second accelerating  
section.

3. (Original) The particle accelerator of Claim 1, wherein said waveguide is a first waveguide and said particle accelerator further comprises a second waveguide connected to said electromagnetic drive subsystem; said second waveguide being at least partially physically interposed between said first accelerating section and said second accelerating section.

4. (Original) The particle accelerator of Claim 3, wherein said first waveguide and said second waveguide share a common wall therebetween.

5. (Currently Amended) The particle accelerator of Claim 4, wherein A particle accelerator  
comprising:

an injector for generating charged particles;

an electromagnetic drive subsystem for generating pulses of electromagnetic waves;

a first accelerating section adapted to receive said electromagnetic waves and to transfer energy from said electromagnetic waves to said charged particles as said charged particles travel therethrough;

a second accelerating section adapted to transfer energy to said charged particles as said charged particles travel therethrough;

a first waveguide connected to said electromagnetic drive subsystem and adapted to deliver said electromagnetic waves from said electromagnetic drive subsystem to said first accelerating section, said first waveguide being at least partially physically interposed between said first accelerating section and said second accelerating section;

a second waveguide connected to said electromagnetic drive subsystem, said second waveguide being at least partially physically interposed between said first accelerating section and said second accelerating section, said second waveguide and said first waveguide sharing a common wall therebetween; and

a tube connected to and extending between said first accelerating section and said second accelerating section, said tube is being defined within said shared common wall and being adapted to enable said charged particles to travel between said first accelerating section and said second accelerating section.

6. (Currently Amended) A particle accelerator comprising:

an injector for generating charged particles;

a radio frequency generator for generating pulses of electromagnetic waves;

a first accelerating section adapted to receive said electromagnetic waves and to transfer energy from said electromagnetic waves to said charged particles as said charged particles travel therethrough, said first accelerating section defining a longitudinal axis thereof;

a second accelerating section adapted to transfer energy to said charged particles as said charged particles travel therethrough;

a 3 dB waveguide hybrid junction having a first waveguide and a second waveguide sharing a common wall therebetween, said wall defining a coupling window therein, said first waveguide defining a longitudinal axis thereof substantially perpendicular to said longitudinal axis of said first accelerating section, said first waveguide being connected to said first accelerating section and said second waveguide being connected to said second accelerating section, said first waveguide being connected to said radio frequency generator; and,

a shorting waveguide connected to said first waveguide of said 3 dB waveguide hybrid junction and having a shorting device therein positioned such that said longitudinal axis of said first accelerating section is substantially between said shorting device and said coupling window.

7. (Original) The particle accelerator of Claim 6, wherein said common wall comprises a first narrow wall of said first waveguide of said 3 dB waveguide hybrid junction and said 3 dB waveguide hybrid junction further comprises a second narrow wall opposing said first narrow wall, a first wide wall, and a second wide wall opposing said first wide wall.

8. (New) The particle accelerator of Claim 1, wherein said tube is defined within said wall.